

What is claimed is:

1. An image processing apparatus for obtaining processed compressed moving image data by carrying out image enhancement processing on compressed moving image data, the  
5 image processing apparatus comprising:

division means for dividing the compressed moving image data into a target part to be corrected and a non-target part not to be corrected;

decoding means for obtaining decoded data by decoding  
10 the target part;

correction means for obtaining corrected decoded data by carrying out the image enhancement processing on the decoded data;

encoding means for encoding the corrected decoded data;  
15 and

combination means for obtaining the processed compressed moving image data by combining the target part that has been encoded with the non-target part.

2. The image processing apparatus according to Claim 1,  
20 wherein the decoding means decodes the target part to a degree that enables the correction means to carry out the image enhancement processing thereon.

3. An image processing apparatus for obtaining processed compressed moving image data by carrying out image  
25 enhancement processing on compressed moving image data obtained according to a compression method using a first frame

as a reference frame, the image processing apparatus comprising:

division means for dividing the compressed moving image data into the first frame and other frames;

5        decoding means for obtaining a decoded first frame by decoding the first frame;

correction means for obtaining a corrected decoded first frame by carrying out the image enhancement processing on the decoded first frame;

10       encoding means for obtaining a corrected first frame by encoding the corrected decoded first frame; and

combination means for obtaining the processed compressed moving image data by combining the corrected first frame with the other frames.

15       4.    An image processing apparatus for obtaining processed compressed moving image data by carrying out image enhancement processing on compressed moving image data comprising intra frames and inter frames, the image processing apparatus comprising:

20       division means for dividing the compressed moving image data into the intra frames and the inter frames;

decoding means for obtaining decoded intra frames by decoding the intra frames;

correction means for obtaining corrected decoded intra  
25 frames by carrying out the image enhancement processing on the decoded intra frames;

encoding means for obtaining corrected intra frames by  
encoding the corrected decoded intra frames; and

combination means for obtaining the processed compressed  
moving image data by combining the corrected intra frames with  
5 the inter frames.

5. The image processing apparatus according to Claim 4  
further comprising block division means for dividing the inter  
frames into intra blocks and inter blocks,

the decoding means further obtaining decoded intra  
10 blocks by decoding the intra blocks,

the correction means further obtaining corrected decoded  
intra blocks by carrying out the image enhancement processing  
on the decoded intra blocks,

the encoding means further obtaining corrected intra  
15 blocks by encoding the corrected decoded intra blocks, and

the combination means obtaining the processed compressed  
moving image data by combining the corrected intra frames and  
the corrected intra blocks with the inter blocks.

6. An image processing apparatus for obtaining  
20 processed compressed moving image data by carrying out image  
enhancement processing on compressed moving image data  
comprising I frames, P frames, and B frames, the image  
processing apparatus comprising:

division means for dividing the compressed moving image  
25 data into the I frames, the P frames and the B frames;

decoding means for obtaining decoded I frames and decoded

P frames by decoding the I frames and the P frames;

correction means for obtaining corrected decoded I frames and corrected decoded P frames by carrying out the image enhancement processing on the decoded I frames and on the  
5 decoded P frames;

encoding means for obtaining corrected I frames and corrected P frames by encoding the corrected decoded I frames and the corrected decoded P frames; and

combination means for obtaining the processed compressed  
10 moving image data by combining the corrected I frames and the corrected P frames with the B frames.

7. The image processing apparatus according to Claim 6 further comprising block division means for dividing the B frames into intra blocks and inter blocks,

15 the decoding means further obtaining decoded intra blocks by decoding the intra blocks,

the correction means further obtaining corrected decoded intra blocks by carrying out the image enhancement processing on the decoded intra blocks,

20 the encoding means further obtaining corrected intra blocks by encoding the corrected decoded intra blocks, and

the combination means obtaining the processed compressed moving image data by combining the corrected I frames, the corrected P frames, and the corrected intra blocks with the  
25 inter blocks.

8. An image processing apparatus for obtaining

processed compressed moving image data by carrying out image enhancement processing on compressed moving image data mainly comprising DCT coefficient data and motion vector data of each frame, the image processing apparatus comprising:

5           extraction means for extracting the DCT coefficient data and the motion vector data from the compressed moving image data;

          decoding means for obtaining decoded data by decoding the compressed moving image data with use of the DCT coefficient data and the motion vector data;

10           correction means for obtaining corrected decoded data by carrying out the image enhancement processing on the decoded data; and

          encoding means for obtaining the processed compressed moving image data by encoding the corrected decoded data, wherein

          the encoding means encodes the corrected decoded data by using the motion vector data obtained by the extraction means.

20           9.   An image processing apparatus for obtaining processed compressed moving image data by carrying out image enhancement processing on compressed moving image data comprising a plurality of frames, the image processing apparatus comprising:

25           division means for dividing the compressed moving image data into target frames and non-target frames;

decoding means for obtaining decoded frames by decoding the target frames;

correction means for obtaining corrected decoded frames by carrying out the image enhancement processing on the decoded frames;

encoding means for obtaining corrected frames by encoding the corrected decoded frames; and

combination means for obtaining the processed compressed moving image data by combining the corrected frames with the non-target frames, wherein the correction means comprises:

correction parameter calculation means for calculating a correction parameter for each of the decoded frames by using data of the corresponding decoded frame;

parameter adjustment means for obtaining an adjusted parameter for each of the decoded frames by adjusting the correction parameter thereof, with use of the correction parameter for the decoded frame or frames that precedes and/or follows the decoded frame corresponding to the correction parameter that is going to be adjusted; and

correction execution means for carrying out the image enhancement processing on each of the decoded frames by using the adjusted parameter.

10. The image processing apparatus according to Claim 9, wherein the parameter adjustment means sets the adjusted parameter for each of the decoded frames as an average of the correction parameter thereof and the correction parameter of

at least one of the decoded frames that precedes and/or follows the corresponding decoded frame.

11. An image processing apparatus for obtaining processed compressed moving image data by carrying out image enhancement processing on compressed moving image data comprising an intra frame and inter frames, the image processing apparatus comprising:

division means for dividing the compressed moving image data into the intra frame, target inter frames and non-target inter frames;

decoding means for obtaining decoded frames comprising a decoded intra frame and decoded target inter frames by decoding the intra frame and the target inter frames;

correction means for obtaining corrected decoded frames by carrying out the image enhancement processing on the decoded frames;

encoding means for obtaining corrected frames by encoding the corrected decoded frames; and

combination means for obtaining the processed compressed moving image data by combining the corrected frames with the non-target inter frames, wherein

the correction means carries out the image enhancement processing on the decoded intra frame by calculating a correction parameter therefor and on the decoded target inter frames by using the correction parameter of the decoded intra frame that immediately precedes the decoded target inter

frames.

12. A program causing a computer to carry out image processing for obtaining processed compressed moving image data through image enhancement processing on compressed moving image data, the image processing comprising the steps of:

dividing the compressed moving image data into a target part to be corrected and a non-target part not to be corrected;

decoding the target part for obtaining decoded data;

carrying out the image enhancement processing on the decoded data for obtaining corrected decoded data;

encoding the corrected decoded data; and

combining the target part that has been encoded with the non-target part for obtaining the processed compressed moving image data.

13. A program causing a computer to carry out image processing for obtaining processed compressed moving image data through image enhancement processing on compressed moving image data obtained according to a compression method using a first frame as a reference frame, the image processing comprising the steps of:

dividing the compressed moving image data into the first frame and other frames;

decoding the first frame for obtaining a decoded first frame;

carrying out the image enhancement processing on the decoded first frame for obtaining a corrected decoded first



frame;

encoding the corrected decoded first frame for obtaining  
a corrected first frame; and

combining the corrected first frame with the other frames  
5 for obtaining the processed compressed moving image data.

14. A program causing a computer to carry out image  
processing for obtaining processed compressed moving image  
data through image enhancement processing on compressed moving  
image data comprising intra frames and inter frames, the image  
10 processing comprising the steps of:

dividing the compressed moving image data into the intra  
frames and the inter frames;

decoding the intra frames for obtaining decoded intra  
frames;

15 carrying out the image enhancement processing on the  
decoded intra frames for obtaining corrected decoded intra  
frames;

encoding the corrected decoded intra frames for  
obtaining corrected intra frames; and

20 combining the corrected intra frames with the inter  
frames for obtaining the processed compressed moving image  
data.

15. The program according to Claim 14,  
the step of dividing further comprising the step of  
25 dividing the inter frames into intra blocks and inter blocks,  
the step of decoding being the step of decoding the intra

frames and the intra blocks for obtaining the decoded intra frames and decoded intra blocks,

the step of carrying out the image enhancement processing being the step of carrying out the image enhancement processing  
5 on the decoded intra frames and on the decoded intra blocks for obtaining the corrected decoded intra frames and corrected decoded intra blocks,

the step of encoding being the step of encoding the corrected decoded intra frames and the corrected decoded intra  
10 blocks for obtaining the corrected intra frames and corrected intra blocks, and

the step of combining being the step of combining the corrected intra frames and the corrected intra blocks with the inter blocks for obtaining the processed compressed moving  
15 image data.

16. A program causing a computer to carry out image processing for obtaining processed compressed moving image data through image enhancement processing on compressed moving image data comprising I frames, P frames, and B frames, the  
20 image processing comprising the steps of:

dividing the compressed moving image data into the I frames, the P frames and the B frames;

decoding the I frames and the P frames for obtaining decoded I frames and decoded P frames;

25 carrying out the image enhancement processing on the decoded I frames and on the decoded P frames for obtaining

corrected decoded I frames and corrected decoded P frames;

encoding the corrected decoded I frames and the corrected decoded P frames for obtaining corrected I frames and corrected P frames; and

5 combining the corrected I frames and the corrected P frames with the B frames for obtaining the processed compressed moving image data.

17. The program according to Claim 16,

the step of dividing further comprising the step of  
10 dividing the B frames into intra blocks and inter blocks,

the step of decoding being the step of decoding the I frames, the P frames, and the intra blocks for obtaining the decoded I frames, the decoded P frames and decoded intra blocks,

the step of carrying out the image enhancement processing  
15 being the step of carrying out the image enhancement processing on the decoded I frames, the decoded P frames and the decoded intra blocks for obtaining the corrected decoded I frames, the corrected decoded P frames, and corrected decoded intra blocks,

the step of encoding being the step of encoding the  
20 corrected decoded I frames, the corrected decoded P frames and the corrected decoded intra blocks for obtaining the corrected I frames, the corrected P frames and corrected intra blocks, and

the step of combining being the step of combining the  
25 corrected I frames, the corrected P frames, and the corrected intra blocks with the inter blocks for obtaining the processed

compressed moving image data.

18. A program causing a computer to carry out image processing for obtaining processed compressed moving image data through image enhancement processing on compressed moving  
5 image data mainly comprising DCT coefficient data and motion vector data of each frame, the image processing comprising the steps of:

extracting the DCT coefficient data and the motion vector data from the compressed moving image data;

10 decoding the compressed moving image data with use of the DCT coefficient data and the motion vector data for obtaining decoded data;

carrying out the image enhancement processing on the decoded data for obtaining corrected decoded data; and

15 encoding the corrected decoded data for obtaining the processed compressed moving image data, wherein

the step of encoding being the step of encoding the corrected decoded data by using the motion vector data obtained at the step of extracting.

20 19. A program causing a computer to carry out image processing for obtaining processed compressed moving image data through image enhancement processing on compressed moving image data comprising a plurality of frames, the image processing comprising the steps of:

25 dividing the compressed moving image data into target frames and non-target frames;

decoding the target frames for obtaining decoded frames;  
carrying out the image enhancement processing on the  
decoded frames for obtaining corrected decoded frames;  
encoding the corrected decoded frames for obtaining  
5 corrected frames; and

combining the corrected frames with the non-target  
frames for obtaining the processed compressed moving image data,  
wherein the step of carrying out the image enhancement  
processing further comprises the steps of:

10 calculating a correction parameter for each of the  
decoded frames by using data of the corresponding decoded  
frame;

obtaining an adjusted parameter for each of the decoded  
frames by adjusting the correction parameter thereof with use  
15 of the correction parameter for the decoded frame or frames  
that precedes and/or follows the decoded frame corresponding  
to the correction parameter that is going to be adjusted; and

carrying out the image enhancement processing on each  
of the decoded frames by using the adjusted parameter.

20 20. A program causing a computer to carry out image  
processing for obtaining processed compressed moving image  
data through image enhancement processing on compressed moving  
image data comprising an intra frame and inter frames, the image  
processing comprising the steps of:

25 dividing the compressed moving image data into the intra  
frame, target inter frames and non-target inter frames;

decoding the intra frame and the target inter frames for obtaining decoded frames comprising a decoded intra frame and decoded target inter frames;

5 carrying out the image enhancement processing on the decoded frames for obtaining corrected decoded frames;

encoding the corrected decoded frames for obtaining corrected frames; and

combining the corrected frames with the non-target inter frames for obtaining the processed compressed moving image data,

10 wherein

the step of carrying out the image enhancement processing is the step of carrying out the image enhancement processing on the decoded intra frame by calculating a correction parameter therefor and on the decoded target inter frames by  
15 using the correction parameter of the decoded intra frame that immediately precedes the decoded target inter frames.